



AUTOMOTIVE REPAIR ENVIRONMENTAL COMPETENCY

DEPARTMENT OF ECOLOGY
HAZARDOUS WASTE AND TOXICS REDUCTION PROGRAM
PUBLICATION 97-408

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AUTOMOTIVE REPAIR

Environmental Competency

Ecology Publication #97-408

SECTION A: Environmental Management

A.1. Understand the Importance of Environmental Management in the Shop Setting.

A.1.1. Describe why it is important to properly manage all wastes.

Performance Objective 1: The student will be able to list some reasons why they must properly dispose of the wastes they create.

- 1) To be in compliance with the laws.
- 2) To avoid fines from regulatory agencies.
- 3) To protect themselves and others from injury and illness.
- 4) To avoid being liable for environmental cleanup.
- 5) To prevent pollution.
- 6) To be a responsible citizen.
- 7) To stay in business.

A.1.2. Know where hazardous waste regulations are found and what agency enforces them.

Performance Objective 1: The student will be able to cite the legal reference for hazardous waste management requirements.

LAW: Chapter 70.105 RCW, **Hazardous Waste Management Act of 1976**

REGULATION: Chapter 173-303 WAC, the **Dangerous Waste Regulations** (The regulation implements the law).

Performance Objective 2: The student will know which Agency enforces the regulations and provides technical assistance, and how to obtain a copy of the regulations.

The **Dangerous Waste Regulations** are enforced by the State Department of Ecology. They can provide you with a copy. Ecology provides assistance to keep businesses in compliance with the laws.

A.1.3. Understand the purpose of the “Waste Management Hierarchy”.

Performance Objective 1: The student will understand what the Waste Management Hierarchy is.

- The Waste Management Hierarchy was set by the legislature to encourage reduction and recycling of wastes instead of disposal.
- The purpose is to provide environmental protection by preventing wastes from being generated rather than controlling the wastes after they have been created.
- Being “in compliance” with the laws means you are doing what is required. The goal of the hierarchy is to think “beyond compliance”, to go the next step to eliminate, reduce, reuse, or recycle your waste.

Performance Objective 2: The student will understand the methods of handling waste in the preferred order, and provide an example of each.

Waste Reduction - To not create a waste in the first place.

- Switching from chlorinated to non-chlorinated cleaners and solvents.
- Eliminating cleaning parts that do not need to be cleaned
- Returning useable antifreeze to the radiator.

Recycling - Reclaim or reuse the waste.

- Using shop towels that are laundered by a permitted laundry.
- Collecting antifreeze for pick-up by a company that will recycle it.
- Recycling floor mop water into cabinet washers.

Treatment - To perform a process on the waste to eliminate its hazards or prepare it for disposal.

- Evaporating cabinet washer water to reduce it's volume.

Incineration - To thermally destroy a waste in an approved incinerator.

- Sending hazardous waste to a facility to be thermally destroyed.

Landfill - To put into an appropriate landfill.

- Sending hazardous waste to a designated Hazardous Waste Landfill.

Performance Objective 3: Given waste streams typical of the shop, the student determine how they are currently handled and if there is a more environmentally sound way to manage the waste.

Performance Objective 4: The student will be able to articulate why waste reduction is the highest priority.

Land disposal and incineration of wastes can be harmful to the environment and costly for the generator. By reducing the amount of waste produced, you can:

- 1) Protect the environment and human health
- 2) Save money
- 3) Reduce your financial liabilities
- 4) Avoid some regulations

A.1.4. Understand what is meant by the term “pollution prevention”.

Performance Objective 1: The student will be able to articulate what “pollution prevention” means and provide general examples.

Pollution prevention is any method of reducing the amount of toxic materials used or released to the environment. It can be accomplished by:

- Replacing toxic materials with less toxic or non-toxic substitutes.
- Changing a process so a hazardous material is no longer needed.

A.1.5. Understand why pollution prevention is desirable.

Performance Objective 1: The student will be able to articulate how pollution prevention can benefit business, employees, and the environment.

- Reducing or replacing toxic materials reduces exposure to harmful substances, creating a healthier, safer workplace.
- By preventing wastes from being generated, you reduce hazardous waste management and disposal costs and liability.

A.2. Understand the basic waste management elements which are required by law for waste accumulation areas, containers, and labeling.

A.2.1. Describe the key requirements of waste accumulation areas

Performance Objective 1: The student will be able to describe the key required elements of a waste accumulation area.

Waste accumulation areas must:

- Be well defined
- Be well marked with warning signs
- Have secondary containment

Performance Objective 2: The student will understand what secondary containment is and determine if it is sufficient in a given waste storage situation.

Secondary containment:

- Waste storage areas must have the ability to contain spills from tipped, overfilled, or ruptured containers.
- The containment must be able to hold 10 percent of the capacity of all stored containers or 110 percent capacity of the largest container, whichever is greatest.

A.2.2. Identify the basic waste container management requirements.

Performance Objective 1: The student will be able to identify the basic waste container management requirements.

- 1) Must be *suitable* for the waste
- 2) Must be in good *condition* and able to hold the waste
- 3) Must be kept *closed*
- 4) Must be *labeled* as hazardous waste
- 5) Must be *labeled* with the appropriate risk warning.

Performance Objective 2: The student will be able to determine if a container is appropriate for a given waste stream.

1) Suitability

<u>Type of Waste:</u>	<u>Appropriate Container:</u>
Waste Solvent	Metal container
Waste Corrosives	Plastic container
Waste Acids	Plastic container

2) Condition

<u>Appropriate:</u>	<u>Not Appropriate:</u>
Clean	Contaminated with other waste
Can hold the waste	Cannot hold waste due to: Sprung

seams,

dents, holes, rust

Performance Objective 3: The student will be able to demonstrate how to close and label a container.

1) Keep Closed: Containers must be kept closed except when emptying or filling.

- The bung should be screwed in tightly.
- Ring lock, if present, should be closed securely to avoid leaks.
- Funnels should be removed except self-closing ones.

2) *Labeled:* Waste containers must be labeled with:

<u>Information on label:</u>	<u>Example:</u>
Dangerous waste	"DANGEROUS WASTE"
The type of waste described	"USED MINERAL SPIRITS"
The hazards listed	"IGNITABLE"

A.3. Understand what the requirements are for spill prevention and cleanup.

Performance Objective 1: The student will be able to articulate the key elements of a spill response plan.

- Instructions on what to do when hazardous materials are spilled
- Who to notify
- The type of personal protection equipment needed
- The location of the spill cleanup supplies
- How to neutralize spills, if possible
- How to dispose of the wastes after cleanup
- How to prevent spills from occurring

Performance Objective 2: The student will be able to demonstrate what to do in case of a large spill of hazardous material.

- Locate and properly use spill response materials
- Contain the spill
- Contact the proper authorities
- Clean it up
- Manage the wastes properly

SECTION B: Automotive Repair Waste Management

B.1. Understand that servicing vehicles creates wastes which must be managed properly.

B.1.1. Identify the specific wastes produced from servicing vehicles and understand the appropriate method of handling each waste.

Performance Objective 1: The student will be able to identify the common wastes that are generated when doing vehicle repair work and know the appropriate handling method.

<u>Waste</u>	<u>Appropriate handling method</u>
Antifreeze	Reuse, recycle on-site or off-site.
Batteries	Recycle; avoid storing for more than 6 months.
Brake fluid	Collect in a separate container, and dispose through a hazardous waste company to burn for energy recovery
Freon (CFC)	Recover using certified recycling equipment and recycle on-site or send off-site.
Parts washer solvent	Recycle through service provider or dispose as hazardous waste. Extend change-out time until solvent is unusable.
Shop towels	Use a commercial service that provides laundered cloth towels.
Sump sludge	Sump sludge should be tested to determine if it is a hazardous waste due to heavy metal or solvent content. If tests show it is hazardous, send it to a hazardous waste management facility.
Tires	Recycle when possible.
Transmission filter	Drain fluid, recycle through scrap metal dealer.
Transmission fluid	Recycle with waste oil
Used oil	Recycle
Used oil filters	Drain oil, recycle filter through scrap metal dealer
Waste fuel	Dispose through hazardous waste company for burning for energy recovery, or dispose of as hazardous waste.

B.1.2. Understand which wastes from vehicle repair are “conditionally exempt” and why.

Performance Objective 1: The student will be able to identify wastes that come from vehicles which are dangerous waste, but can be conditionally exempt from the regulations if managed according to best management practices. Describe when these wastes are conditionally exempt.

<u>Waste</u>	<u>When Exempt From Regulations</u>
Antifreeze	When it is recycled.
Batteries	When they are recycled.
Freon	When it is captured and recycled.
Shop towels	When they are cleaned at a commercial laundry.
Used Oil	When it is re-refined. If it is burned for energy recovery, some regulations may apply.

If these wastes are recycled, they do not need to be counted and manifested as hazardous waste. If they are disposed, they are subject to full regulation, unless a determination is made that they are not hazardous.

B.2. Understand what cross-contamination of vehicle wastes is and how to avoid it.

B.2.1. Define “cross contamination” and explain why it is undesirable.

Performance Objective 1: The student will understand what is meant by “cross contamination” and be able to provide reasons why it is undesirable.

- Combining a waste with another waste will cause the mixture to be more difficult to manage, almost impossible to recycle or reuse, or more expensive to manage.
- Mixing wastes could even cause a chemical reaction that could produce an explosion or toxic gases.
- Mixing a “conditionally exempt” waste or a solid waste with a hazardous waste can cause the whole mixture to be classified as a hazardous waste, and subject to the regulations.

B.2.2. Describe common occurrences of cross-contamination.

Performance Objective 1: The student will be able to give examples of common occurrences of cross-contamination.

- Using one drain pan to catch different waste fluids, without cleaning out the pan thoroughly between collecting.
- Adding any dangerous waste, such as solvent, to antifreeze or used oil (conditionally exempt) will make the antifreeze or used oil dangerous waste.
- Drums of solvent and used oil in a secondary containment area leak and the wastes mix together, creating a regulated waste that will be disposed as dangerous waste rather than each waste being recycled.

B.2.3. List management practices to avoid cross contamination.

Performance Objective 1: The student will be able to describe how to avoid cross contamination of wastes.

- Use separate pans for oil, antifreeze, brake fluid, and any other fluid that are drained from the vehicle.
- Keep waste streams separate.
- Put the waste in properly labeled containers that don't leak, are not damaged, and can be securely closed.

B.3. Understand what wastewater is, where it is generated, and how to manage it appropriately.

B.3.1. Define wastewater.

Performance Objective 1: The student will be able to define the term “wastewater”.

Wastewater is water that has been used for a purpose, but is no longer usable for that purpose, and will be disposed of. All process wastewater should go to a sewer and not to any other type of drain.

B.3.2. Identify the common wastewater discharge destinations and which wastewater can be disposed to each.

Performance Objective 1: Name the common wastewater discharge points and the appropriate wastes that can be discharged to each.

<u>Discharge point:</u>	<u>Wastewater allowed:</u>
Sanitary sewer	Industrial process waters, sewage; floor wash water.
Septic system	Sanitary sewage, domestic wastewater.
Storm drains	Uncontaminated stormwater, rainfall, snowmelt.
Combined storm/sewer* industrial	Treated stormwater, rainfall, snowmelt, process waters and sewage.
Dry well	Treated stormwater, rainfall, snowmelt.

(A combined drain system allows for stormwater to be collected and run to the sewer. It is a sewer system with some storm drains linked to it. At no time is sewer water allowed to go to a storm drain.)*

B.3.3. Identify the common wastewater sources in vehicle repair shops and the appropriate discharge method.

Performance Objective 1: Identify the four main sources of wastewater discharge from vehicle repair shops identify the appropriate way to discharge.

<u>Wastewater Source</u>	<u>Discharge to:</u>
Floor cleaning wastewater	Oil/water separator* and then sanitary sewer.
Steam cleaning wastewater	Oil/water separator and then sanitary sewer.
Pressure washing wastewater	Oil/water separator and then sanitary sewer.
Vehicle washing wastewater	Oil/water separator and then sanitary sewer.
Spray cabinet wastewater	Oil/water separator and then sanitary sewer.

* Used generically. There are many types of systems available.

B.3.4. Identify methods to minimize the amount of wastewater discharged.

Performance Objective 1: The student will be able to identify ways to minimize the discharge from the following sources.

<u>Wastewater Source</u>	<u>How to minimize discharge:</u>
Floor cleaning wastewater	Use mop and bucket instead of flushing floor with water.
Steam cleaning wastewater	Use a brush to physically remove most dirt before washing. Recirculate water until unusable
Pressure washing wastewater	Use a brush to physically remove most dirt before washing. Reuse and recirculate water until unusable
Vehicle washing wastewater	Use a brush to physically remove most dirt before washing. Recirculate water until unusable
Spray cabinet wastewater	Use a brush to physically remove most dirt before washing. Recirculate water until unusable

B.3.4. Identify wastewater discharge criteria to sewers.

Performance Objective 1: The student will list three situations when a wastewater may not be discharged to a sewer without treatment prior to disposal.

Wastewater may not be discharged if:

1. It exceeds the treatment plants discharge limit on **fats, oils, and greases.**
2. It exceeds the acceptable **pH range**, either higher or lower
3. It designates as a **Dangerous Waste.**

B.4. Understand what cleaning process wastes are and how they are best handled.

B.4.1. Define cleaning process wastes.

Performance Objective 1: The student will be able to identify the main cleaning process wastes generated from vehicle repair.

- Shop towels
- Spent solvent
- Vehicle washing wastewater
- Floor cleaning wastewater
- Steam or pressure washing wastewater
- Spray cabinet wastewater

B.4.2. Describe how to manage cleaning process wastes.

Performance Objective 1: Understand how the wastes generated from cleaning processes should be handled.

- **Shop towels** that are laundered by a commercial laundry are exempt from hazardous waste regulations. Disposable shop towels may need to be handled as dangerous waste, depending on what is on them.
- **Spent solvent** should be managed as dangerous waste and either recycled or disposed.
- **Floor cleaning wastewater** should be minimized by sweeping floors before washing. The floor washwater should be discharged to a sanitary sewer system.
- **Vehicle washing wastewater** should be discharged to an oil/water separator and then to a sanitary sewer system.
- **Steamcleaning or pressure washing wastewater** should be discharged to an oil/water separator and then to a sanitary sewer system.

B.5. Identify the main sources of air pollutants found in vehicle shops and how to control the releases.

B.5.1. Identify sources of air pollutants

Performance Objective 1: The student will be able to identify sources of air pollutants present in vehicle repair shops.

- Freon from air-conditioning servicing
- Solvents from air-drying solvent soaked parts
- Air borne substances from spray cans

B.5.2. How to minimize and/or control releases of air pollutants

Performance Objective 1: The student will be able to describe ways to minimize and control releases to the air of the following:

Air Release Source

Freon
Solvents
Aerosol spray cans
spray.

How to minimize discharge:

Certify technicians; use approved equipment.
Do not air dry solvent-soaked towels or parts.
Use refillable spray cans that don't mist the

Environmental Competencies

- - - Evaluation - - -

Dear Vocational Instructor: In order to improve our services, the ***Department of Ecology*** asks you to please complete this evaluation on the environmental competencies you have used. We will use your comments for future revisions. **THANK YOU !**

This evaluation is for the environmental competency in (Circle):

AUTO REPAIR AUTO BODY DENTAL PHOTO
WOODWORKING

Ranking: Level of satisfaction / agreement: 1 = Low 5 = Average 10 = High

1). The information in this competency is appropriate for the students.

1 2 3 4 5 6 7 8 9 10

2). The level of detail was sufficient for me to teach it.

1 2 3 4 5 6 7 8 9 10

3). The supplemental materials answered most of my questions.

1 2 3 4 5 6 7 8 9 10

4). It was easy to incorporate the competency into the curriculum.

1 2 3 4 5 6 7 8 9 10

5). The layout was clear and easy to use.

1 2 3 4 5 6 7 8 9 10

6). It is important for students to learn about environmental management.

1 2 3 4 5 6 7 8 9 10

7). "I have incorporated this information into my curriculum."

1 2 3 4 5 6 7 8 9 10

8). Additional comments, or suggestions: _____

9). Requests for additional info: _____

10). **Name & Program:** _____

School: _____

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